

The Effectiveness of Non-governmental Organizations in Promoting the Awareness of Hypertension and Self-Control Management Measures of Families

Homayoun Sadeghi-Bazargani¹; Saeid Safiri^{2,*}; Mostafa Farahbakhsh³; Shahram Habibzadeh⁴; Alireza Nikniaz⁵; Ahmad Kousha⁶; Harshani Jayasinghe⁷; Alieh Yousefi⁴

¹Road Traffic Injury Research Center, Department of Statistics and Epidemiology, Tabriz University of Medical Sciences, Tabriz, IR Iran

²Department of Public Health, School of Nursing and Midwifery, Maragheh University of Medical Sciences, Maragheh, IR Iran

³Clinical Psychiatry Research Center, Razi Hospital, Tabriz University of Medical Sciences, Tabriz, IR Iran

⁴Department of Infectious Disease, Imam Khomeini Hospital, Ardabil University of Medical Sciences, Ardabil, IR Iran

⁵National Public Health Management Center, Tabriz University of Medical Sciences, Tabriz, IR Iran

⁶Department of Health Education and Promotion, Tabriz University of Medical Sciences, Tabriz, IR Iran

⁷Clinical Practice Unit, The Basil Hetzel Institute for Translational Health Research, Respiratory Medicine, The Queen Elizabeth Hospital, The University of Adelaide, South Australia, Australia

*Corresponding author: Saeid Safiri, Department of Public Health, School of Nursing and Midwifery, Maragheh University of Medical Sciences, Maragheh, IR Iran. Tel/Fax: +98-4133373741, E-mail: S-safiri@razi.tums.ac.ir, Saeidsafiri@gmail.com

Received: January 3, 2015; **Revised:** February 17, 2015; **Accepted:** February 18, 2015

Background: Despite the known risks of having high blood pressure, there is still a high prevalence of undiagnosed hypertension cases in society. A number of suggestions have been put forth over the years to counteract this issue. One suggestion was implementing a screening program; however, there was a high cost as well as a fear of low accessibility from lower socio-economic classes. Alternatively, there has been a suggestion to raise the degree of awareness about the risks of having high blood pressure.

Objectives: The aim of this study was to determine the effectiveness of using nongovernmental organizations (NGOs) to promote awareness of hypertension and self-control management methods in families in Ardabil, Iran.

Patients and Methods: In 2007, a quasi-experimental study was completed with the collaboration of local volunteers in Ardabil. A total of 84 volunteers and 121 patients with hypertension were included in the study. Educational workshops were held for the volunteers by the NGO (Saman) and patients were educated by the volunteers. Thereafter, both groups were assessed for awareness by using self-administered questionnaires. The data was then statistically analyzed by paired t-test.

Results: Approximately half of the volunteers aged between 21 and 30 years, 94% of them were female and 68% of this cohort was single at the time of the study. Approximately 46% of the volunteers had an education level equivalent to a diploma. Paired-samples t test revealed that there was a statistically significant difference ($P < 0.05$) between the scores of awareness before and after education in both groups.

Conclusions: Holding workshops by NGOs to train volunteers on hypertension is a helpful method to increase awareness about hypertension and control measures in patients with high blood pressure.

Keywords: Organizations; Education; Hypertension; Volunteers; Iran

1. Background

Hypertension is considered as one of the most important modifiable risk factors of cardiovascular diseases (CVD) and has a high prevalence in the community. It is characterized by having abnormally high blood pressure (1). Hypertension is influenced by a number of factors including sex, age, race, and socio-economic status (2). People who have hypertension have an increased risk of stroke, myocardial infarction, peripheral vascular disease, and congestive heart failure (1). It is further thought that hypertension works in synergy and often intensifies other cardiovascular risk factors such as smoking, obesity, and diabetes mellitus (3). The rates of hypertension in society have been on a downward trend over the last two decades; however, an increasing trend of hyperten-

sion incidences in middle and low income countries is reported (2, 4). It is estimated that two-thirds of hypertension cases are found in developing countries (5). Iran is one such developing country. It is located in the Middle East and is home to different people and ethnicities. A systematic review of published hypertension studies in Iran found that 22.1% of people were hypertensive, which was lower than countries such as the United States (30.4%), China (40%), Oman (53%), United Arab Emirates (50%), Qatar (49%), Bahrain (60%), and Yemen (33%), but the prevalence is going to be similar with them (2, 6-8). Some studies indicated that there was considerable variation in the prevalence of hypertension between different ethnic groups and across different geographic locations within

Iran with some studies indicating that the North-West regions of the country had a higher prevalence of hypertension (9). Due to the low awareness of hypertension in these societies and the asymptomatic nature of hypertension, it is not surprising that a large proportion of patients with hypertension are unaware of their condition. This unawareness is not limited to the developing countries. A study on adults older than 18 years in the United States in 2003 - 2010 found that 39.4% of patients with hypertension were not aware of their disease (6). Moreover, a study in China found that more than 40% of the patients with hypertension were unaware of their disease (8). The Iranian National Household Survey revealed that only 34% of people were aware of their disease (10). However, big cities such as Tehran (50%) and Isfahan (43.8%) showcased slightly higher rates of awareness (11, 12). The unawareness of this prominent and life-threatening disease in society is gravely concerning and could lead to serious health outcomes. It should also be noted that being aware of the disease does not necessarily guarantee a better health outcome or quality of life. Alarmingly, only between one-fourth and half of people who are aware of their hypertension receive appropriate medical treatment (6, 8, 13). This is quite concerning, as appropriate management of hypertension can considerably reduce the risk of stroke and decrease mortality rate (13). There are several methods for reducing undiagnosed hypertension cases. First, screening could be performed by health-care facilities; however, it is associated with high cost and could potentially reduce feasibility in lower socio-economic regions of society such as the rural areas. A second option may be implementing door-to-door screening, but it is also associated with high cost. The third and final alternative is based on non-medical volunteers participation, as main component of clinical governance (14), to introduce self-measurement of hypertension at home (15). The previous studies on this issue have highlighted that the final option, to do with self-management, would be the most effective, feasible, and accessible option (16, 17). Nongovernmental Organizations (NGOs) seem to be useful in promoting awareness in targeted populations (18).

2. Objectives

The aim of this study was to determine the effectiveness of using a particular NGO (Saman) and trained volunteers to promote awareness of hypertension, and self-control methods for management in family members of volunteers who had hypertension.

3. Materials and Methods

3.1. Study Design

This quasi-experimental nonrandomized clinical trial was conducted on participants from Ardabil, North-West of Iran. This study was completed in 2007.

3.2. Setting and Participants

This study was conducted at the Ardabil Social Development and Health Promotion Centre. Ardabil is a historical city in north-western Iran. Ardabil is the center of Ardabil Province. At the 2011 census, its population was 564365, with 156324 families, where the majority are ethnic Azeri. Ardabil is about 70 km far from the Caspian Sea, and 210 km far from Tabriz City. It has an average altitude of 1263 m (4144 ft) and total area of 18.011 km². Neighboring to the Caspian Sea and the Republic of Azerbaijan, this city is of great political and economic significance. This site was chosen because it was thought to be a good place to facilitate the management and participation of volunteers. In addition to the involvement of the center, one of the local NGOs (Saman) also participated in the study. The study had two main groups: volunteers and patients. A total of 84 volunteers and 121 patients were included. Initially, the protocols required for measuring blood pressure was described to the participants. There were three phases that a participant needed to pass to be considered as a volunteer for the study. First, they had to be able to register in Ardabil Social Development and Health Promotion to participate in the Hypertension Project. Second, they needed to be able to participate in the introductory sessions and needed to be competent enough to fill out the basic information and consent forms. Third, they needed to be able to participate in scientific workshops about basic information, prevention, treatment, complications, and control of hypertension. Furthermore, the volunteers had to have family members with hypertension, be a resident in a covered area, and have an education level higher than guidance school. Absence of a patient with hypertension in family was considered as exclusion criteria for volunteers. To be considered as a patient in the study, a subject had to have systolic and diastolic blood pressures of > 140 and > 90 mm Hg, respectively. Patients who did not tend to participate in the study were excluded. This study was approved by Ethic Committee of Ardabil University of Medical Sciences. In the first stage, informed consent was obtained from the volunteers to participate in the study. Then, informed consent was only received from patients of the eligible volunteers' family. In addition, both of the groups were interested to participate in the study due to the educational workshops.

3.3. Intervention

The intervention was based on the ability of both the volunteers and the patients to remember the techniques and information taught at the workshops. People were encouraged to participate in training for the hypertension, empowerment, and hypertension control in family projects. After the initial registration, participants who passed the initial screening and had family members with hypertension were recruited as volunteers and were trained at the workshops on appropriate management measures for hypertension. These volunteers were then

subsequently responsible for training the patients in their family with the techniques that they learnt at these workshops. The awareness level of volunteers and their family members about basic information, symptoms, treatment, prevention, and possible complications of hypertension were assessed before and after intervention with standardized protocols. All of the workshops were held in morning. Four sessions were held for volunteers. A self-administered questionnaire was used to assess the knowledge of the volunteers and patients and the questions were the same for both groups. About 34 questions about definition, symptom, awareness, measurement technique, familial history, medical treatment, self-control measures, etiology, medical treatment conditions, nutritional preventive measures, life style interventions, stroke symptoms, importance, hypertension control importance, the feasibility of self-management of hypertension, and importance of regular medical treatment were asked from both groups. The questionnaire for the volunteers was self-reported and was completed before and after the workshops. Due to the low literacy level among the patients, the patients' questionnaire was completed in the home with help of the volunteers.

3.4. Sampling and Sample Size

The sample size was calculated using PS software version 2.1.31 (PS Corporation, Nashville, Tennessee, United States) based on mean comparison tests to ensure 80% statistical power and type I error < 0.05. Based on calculated sample size, at least 80 volunteers and 80 patients had to be included (16). Finally, about 84 volunteers were chosen by call. A total of 121 patients were selected by the volunteers after they had received adequate training at the workshops.

3.5. Statistical Analysis

The data were analyzed by using SPSS 21 (SPSS Inc. Chicago, Illinois, United States) to calculate frequencies and percentages. Paired t-test was used to analyze and assess associations.

4. Results

A total of 84 volunteers were included in the study with 94% being female. Approximately half of these volunteers aged between 21 and 30 years and almost 50% of them held a higher-level diploma. Query into relationship status revealed that 65% of this cohort was single at the time of the study. There were 121 patients in this study, 67.8% were female and approximately half of them aged between 31 and 50 years (Table 1). Paired-samples t test revealed that there was a statistically significant difference between the scores of awareness before and after the education in both groups. Table 2 highlights that after education, volunteers showed statistically significant differences ($P < 0.05$) before and after intervention in all four areas of awareness assessed, i.e. basic, prevention,

therapy, and adverse effects. All four areas had higher scores, as assessed by the questionnaires, after education and intervention. This same finding was demonstrated in the patient group; they showed a statistically significant difference and an increase in awareness in four measured areas before and after intervention ($P < 0.05$) (Table 3).

Table 1. Demographic Characteristics of Volunteers and Patients ^a

Variables	Values
Volunteers (n = 84)	
Gender	
Male	5 (6)
Female	79 (94)
Age, y	
< 20	29 (34.5)
21 - 30	41 (48.8)
31 - 40	12 (14.3)
> 40	2 (2.4)
Marital Status	
Single	57 (68)
Married	27 (32)
Education level	
< diploma	31 (37)
Diploma	39 (46.2)
> diploma	14 (16.6)
Patients (n = 121)	
Gender	
Male	22 (18.2)
Female	99 (81.8)
Age, y	
30 >	3 (3.8)
31 - 50	41 (51.3)
51 - 70	28 (35)
70 <	8 (10)

^a Data are presented as No. (%)

Table 2. Comparison of the Volunteers' Knowledge About Hypertension Before and After the Education

Knowledge Type	Mean \pm SD	Range	P Value
Basic			< 0.01
Before	37.15 \pm 11.34	13 - 64	
After	59.07 \pm 6.47	45 - 75	
Prevention			< 0.01
Before	4.59 \pm 3.40	0 - 12	
After	8.69 \pm 2.57	1 - 13	
Therapy			0.03
Before	18.40 \pm 5.08	7 - 31	
After	23.34 \pm 4.13	14 - 31	
Adverse effects			< 0.01
Before	8.30 \pm 3.76	0 - 16	
After	22.57 \pm 3.40	17 - 35	

Table 3. Comparison of the Patients' Knowledge About Hypertension Before and After the Education

Knowledge Type	Mean \pm SD	Range	P Value
Basic			< 0.01
Before	14.66 \pm 4.64	5 - 26	
After	29.65 \pm 3.05	23 - 38	
Prevention			< 0.01
Before	1.74 \pm 1.25	0 - 4	
After	4.03 \pm 1.18	0 - 6	
Therapy			0.04
Before	3.68 \pm 1.81	0 - 7	
After	11.94 \pm 2.03	7 - 15	
Adverse effects			<0.01
Before	3.41 \pm 1.68	0 - 7	
After	12.08 \pm 1.61	9 - 19	

5. Discussion

The findings of our study indicate that the workshops that were implemented by the NGO (Saman) about hypertension were effective in raising awareness amongst this cohort. The study highlights the potential that volunteers have in enhancing awareness of important health issues to specific populations of people. Moreover, a Canadian study also found that collaboration of government with NGOs and volunteers increases the rate of diagnosis and treatment of patients with hypertension (19). Other studies have also supported the important role that NGOs can have; for example, one study conducted by Crane et al. showed that NGOs role in the education of sexually transmitted diseases (STD)/AIDS and raising awareness in society was significant (20). Most studies have indicated that NGOs could be used in promoting and improving public health problems (21, 22) and to increase the quality of health services (23). However, the studies also highlight that greater collaboration is needed between NGOs and governments, particularly in the areas of chronic diseases. Although developing such collaborations are often complicated to start, requiring lots of time, management strategies, and energy to establish, an effort should be made because of the many possible benefits that could arise with such collaborations. These collaborations could be vital to society, and would have benefits such as increasing awareness of major health issues in society. This could eventually lead to either better health outcomes or better management of disease. However, without adequate government support and funding, NGOs will struggle to achieve such goals (24). It is important to highlight that the use of NGO's not only can be a powerful tool for the management of non-communicable diseases such as hypertension, but also can raise awareness of communicable diseases such as HIV and obesity. Finally, hypertension is a major public health concern, par-

ticularly in developing countries. Using NGOs seems to be effective in self-management routines and in increasing the awareness to patients about basic information of symptoms, treatment, prevention, and possible complications of hypertension. These Organizations along with the governmental ones could potentially play a vital role in the management of diseases and should not be forgotten when deciding upon management plans. This idea could be used as second pilot study among the military forces. Military organizations have specific and high level discipline, which would help increase the quality control measures of study by involved health personnel.

5.1. Limitations of the Study

The completion of the questionnaire by the patients at home was one of the limitations, which could be prevented in organization with help of the health personnel and volunteers. The same questionnaire for both groups had some limitations, which graphical questionnaire seems to be more appropriate for patients due to their low literacy level.

Acknowledgements

We thank all those who helped us to conduct this research project.

Authors' Contributions

Study concept and design: Homayoun Sadeghi-Bazargani, Mostafa Farahbakhsh, Shahram Habibzadeh, and Alireza Nikniaz; Acquisition of data: Alieh Yousefi; Analysis and interpretation of data: Saeid Safiri and Homayoun Sadeghi-Bazargani; Drafting the manuscript: Saeid Safiri and Harshani Jayasinghe; Critical revision of the manuscript for important intellectual content: Saeid Safiri, Homayoun Sadeghi-Bazargani, and Ahmad Kousha; Statistical analysis: Saeid Safiri; Administrative, technical, and material support: Homayoun Sadeghi-Bazargani, Mostafa Farahbakhsh, and Shahram Habibzadeh; Study supervision: Homayoun Sadeghi-Bazargani, Mostafa Farahbakhsh, and Shahram Habibzadeh.

Funding/Support

This study was funded by Ardabil University of Medical Sciences.

References

- Whelton PK. Epidemiology of hypertension. *lancet*. 1994;**344**(8915):101-6.
- Haghdoust AA, Sadeghirad B, Rezaadehkermani M. Epidemiology and heterogeneity of hypertension in Iran: a systematic review. *Arch Iran Med*. 2008;**11**(4):444-52.
- Collins R, Peto R, MacMahon S, Hebert P, Fiebach NH, Eberlein KA, et al. Blood pressure, stroke, and coronary heart disease. Part 2, Short-term reductions in blood pressure: overview of randomised drug trials in their epidemiological context. *Lancet*. 1990;**335**(8693):827-38.
- Danaei G, Finucane MM, Lin JK, Singh GM, Paciorek CJ, Cowan

- MJ, et al. National, regional, and global trends in systolic blood pressure since 1980: systematic analysis of health examination surveys and epidemiological studies with 786 country-years and 5.4 million participants. *Lancet*. 2011;**377**(9765):568-77.
5. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden of hypertension: analysis of worldwide data. *Lancet*. 2005;**365**(9455):217-23.
 6. Centers for Disease C, Prevention.. Vital signs: awareness and treatment of uncontrolled hypertension among adults--United States, 2003-2010. *MMWR Morb Mortal Wkly Rep*. 2012;**61**:703-9.
 7. El-Menyar A, Zubaid M, Shehab A, Bulbanat B, Albustani N, Alenezi F, et al. Prevalence and impact of cardiovascular risk factors among patients presenting with acute coronary syndrome in the middle East. *Clin Cardiol*. 2011;**34**(1):51-8.
 8. Feng XL, Pang M, Beard J. Health system strengthening and hypertension awareness, treatment and control: data from the China Health and Retirement Longitudinal Study. *Bull World Health Organ*. 2014;**92**(1):29-41.
 9. Ebrahimi M, Mansournia MA, Haghdoust AA, Abazari A, Alaeddini F, Mirzazadeh A, et al. Social disparities in prevalence, treatment and control of hypertension in Iran: second National Surveillance of Risk Factors of Noncommunicable Diseases, 2006. *J Hypertens*. 2010;**28**(8):1620-9.
 10. Esteghamati A, Abbasi M, Alikhani S, Gouya MM, Delavari A, Shishehbor MH, et al. Prevalence, awareness, treatment, and risk factors associated with hypertension in the Iranian population: the national survey of risk factors for noncommunicable diseases of Iran. *Am J Hypertens*. 2008;**21**(6):620-6.
 11. Azizi F, Ghanbarian A, Madjid M, Rahmani M. Distribution of blood pressure and prevalence of hypertension in Tehran adult population: Tehran Lipid and Glucose Study (TLGS), 1999-2000. *J Hum Hypertens*. 2002;**16**(5):305-12.
 12. Sarraf Zadeegan N, Boshtam M, Mostafavi S, Rafiei M. Prevalence of hypertension and associated risk factors in Isfahan, Islamic Republic of Iran. *East Mediterr Health J*. 1999;**5**(5):993.
 13. Burt VL, Whelton P, Roccella EJ, Brown C, Cutler JA, Higgins M, et al. Prevalence of hypertension in the US adult population. Results from the Third National Health and Nutrition Examination Survey, 1988-1991. *Hypertension*. 1995;**25**(3):305-13.
 14. Tabrizi JS, Saadati M, Sadeghi-Bazargani H. Development of performance indicators for patient and public involvement in hospital: expert consensus recommendations based on the available evidence. *J Clin Res Gov*. 2013;**2**(1):26-30.
 15. Cooke CJ, Meyers A. The role of community volunteers in health interventions: a hypertension screening and follow-up program. *Am J Public Health*. 1983;**73**(2):193-4.
 16. Halme L, Vesalainen R, Kaaja M, Kantola I, H. Ome MEasurement of blood pressure study group . Self-monitoring of blood pressure promotes achievement of blood pressure target in primary health care. *Am J Hypertens*. 2005;**18**(11):1415-20.
 17. Parati G, Omboni S, Albini F, Piantoni L, Giuliano A, Revera M, et al. Home blood pressure telemonitoring improves hypertension control in general practice. The TeleBPCare study. *J Hypertens*. 2009;**27**(1):198-203.
 18. Ehiaghe F. The Contribution of Government and Non Governmental Organization Support for Education IN Benin City, Nigeria. *J Soc Sci Res*. 2014;**3**(2):264-9.
 19. Campbell NR. Hypertension prevention and control in Canada. *J Am Soc Hypertens*. 2008;**2**(2):97-105.
 20. Crane SF, Carswell JW. A review and assessment of non-governmental organization-based STD/AIDS education and prevention projects for marginalized groups. *Health Educ Res*. 1992;**7**(2):175-94.
 21. Knowles JC, Pernia EM, Hollnsteiner MR. *Social consequences of the financial crisis in Asia*. Philippines: Economics and Development Resource Center; 1999.
 22. Silliman GS, Noble LG. *Organizing for Democracy: Ngos, Civil Society, and the Philippine State*. University of Hawaii Press; 1998.
 23. Lorgen CC. Dancing with the state: the role of NGOs in health care and health policy. *J Int Dev*. 1998;**10**(3):323-39.
 24. Field P, Gregory G. Non-government organisations to combine for work on chronic disease in Aboriginal peoples, Torres Strait Islanders and rural and remote populations. *Aust J Rural Health*. 2000;**8**(4):239-42.